Technical Memorandum
Comments on the Draft Baseline Ecological Risk Assessment Work Plan & Sampling and Analysis Plan
Gulfco Marine Maintenance Superfund Site
Freeport, Texas
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Prepared for

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1.0 INTRODUCTION

This Technical Memorandum summarizes EA Engineering, Science, and Technology, Inc.'s technical review comments for the Draft Baseline Ecological Risk Assessment (BERA) Work Plan & Sampling and Analysis Plan (WP & SAP) prepared by Pastor, Behling & Wheeler, LLC (PBW) for the Gulfco Marine Maintenance Superfund Site (site), located in Freeport, Texas, and submitted to the U.S. Environmental Protection Agency (EPA) on 10 March 2010. The technical review was conducted to assure that the Draft BERA WP & SAP complies with guidance, is consistent with conclusions reached in the BERA Problem Formulation, and appropriate conclusions were reached.

General technical review comments pertaining to the Draft BERA WP & SAP are provided in Section 2.0. Specific technical review comments associated with the body of the Draft BERA WP and SAP, including the tables and figures, are provided in Section 3.0. Section 4.0 provides a summary based on the outcome of the technical review.

2.0 GENERAL TECHNICAL REVIEW COMMENTS

General Comment 1.

Questions were raised regarding the elimination of certain contaminants of potential ecological concern (COPEC) during the problem formulation, specifically metals. Metals were eliminated from further consideration during the problem formulation based on a comparison to background. As noted in comments on that document, the statistical analyses used as the basis of this conclusion are suspect, and the background comparison needs to be reassessed. If any metals are added back in as a result of these re-analyses, the metals analyses will need to be incorporated into the work plan.

General Comment 2.

There are several references to acid volatile sulfide/simultaneously extracted metals (AVS/SEM) analysis (e.g. Section 2.5.3, page 10; Section 3.3, page 13, sediment chemical analysis). If, as discussed in General Comment 1, no metals have proceeded to the BERA, there is no reason to analyze AVS/SEM.

General Comment 3.

In Section 3.1, Data Quality Objectives, the following statement is made, "The DQO development process is constrained by several factors..." "Given these limitations the steps of the DQO process have been completed in a manner to produce qualitative and quantitative statements to develop and appropriate study design to address the needs of the BERA." The 7-step DQO process documented in EPA (2006) is adaptable to a BERA, and should be presented in the document, including "if-then" statements. Just because multiple lines-of-

evidence are used in an ecological risk assessment does not mean that the DQO process does not apply. Similarly, this applies to Section 5.3.

General Comment 4.

No defined DQOs (as discussed above in General Comment 3) result in the absence of clear directions as to how the collected data will be interpreted and applied. For example, toxicity tests can; along with other lines of evidence, assist in the determination of whether the matrix is toxic. Apparent effects in toxicity tests will not tell one exactly which chemical is causing the toxicity, but these data, used with other lines of evidence (such as dry sediment concentrations exceeding probable effect concentrations) can assist in determining which particular chemical(s) are responsible for the toxicity. It is recommended that the document be revised to include a discussion of how chemical analytical and bioassay results can be used in making risk management decisions and setting remedial objectives. This could be included in the updated DQO section, particularly in the "if-then" series of project decisions. A first step would be discussion of how the weight of evidence will be used to determine whether risks require further consideration in risk management. The text should then discuss how risk results would be used to set remedial action objectives. Finally, text should be added to discuss how data can be used to define remedial action levels. Standard methods include but are not limited to:

a. Creating a regression relating chemistry to bioassay results and selecting chemical concentrations as clean-up goals based on an expected level of impact;
b. Creating effects and no effects ranges of concentrations based on bioassay results and using these to establish effects thresholds; and
c. Using bioavailability data to modify literature-based benchmarks, and evaluating relevance based on relationships to bioassay results.

General Comment 5.

Section 5.3, page 30, last paragraph: States, "Based on the results of the Problem Formulation...quality of data and acceptable levels of decision error were established as presented in Section 3.0." Section 3.0 did not present the quality or acceptable levels of decision error.

General Comment 6.

Are any field measurements to be taken (e.g. salinity, DO, temperature, etc.)? If so, this has not been noted. Field measurements of water quality parameters at sediment and surface water locations would potentially provide useful information.

General Comment 7.

The work plan identifies general risk assessment questions and discusses data interpretation in broad terms. The work plan states that a line-of-evidence approach will

be used to draw conclusions regarding site risks. Additional discussion is required regarding the specific comparisons, statistical analyses, and test endpoints to be evaluated. It may be beneficial to list specific hypotheses to be tested.

3.0 SPECIFIC TECHNICAL REVIEW COMMENTS

The following technical review comments (Specific Comments 1 through 11) are associated with the body of the Draft BERA Problem Formulation, including the tables and figures.

1. **Section 3.1, 2nd paragraph, page 11 and Section 5.3, page 29**

   Reference is made to USEPA DQO process, and refers to EPA (2000). EPA (2000) was updated in EPA (2006), and there were some changes to the names of the process. The DQO statements should reflect the revised guidance.

2. **Table 2, Analytical Methods**

   This table is not referenced in the text.

3. **Section 3.3, Sediment chemical analyses, bottom of page 13**

   The following sentence is found: "...EPA has developed a recommended approach for estimating metal toxicity..." While metals in sediment may be added as a COPEC upon re-review of the background comparison (Problem Formulation), as it presently stands, there are no metals that have been identified as COPEC in sediment, only copper in surface water. Absent metal COPEC in sediment, AVS/SEM is not required. TOC will assist in the estimation of the bioavailability of non-polar organics such as DDT and should be assessed.

4. **Section 3.3, Surface water analyses, page 14**

   This section states method 6010/6020 will be used to assess dissolved copper. Because the water is saline, it is likely that there will be elevated method detection and reporting limits because of sample dilution. Has there been an assessment to determine if either of these methods will achieve the detection limit required for surface water risk values?

5. **Section 3.5, page 15**

   This section states that a line-of-evidence approach will be used. Additional discussion is required regarding both the individual lines of evidence and the overall weight of evidence evaluation. For lines of evidence, the following additional information should be included:

   a. test endpoints (as listed later on page 26) and their relevance;

b. details regarding comparisons, including whether they will be conducted quantitatively or qualitatively; whether they will be conducted on a location-by-location basis or using group statistics; the type of statistics planned; and the planned interpretation of comparisons to both reference and control samples;
c. details regarding trend analyses, including whether they will be conducted quantitatively or qualitatively; the type of statistics planned; source-related parameters (i.e. sediment and pore water COPEC concentrations, AVS/SEM results, etc.) to be evaluated for influence on bioassays; and non-source related parameters to be evaluated for influence on bioassays (i.e. ammonia, grain size, salinity etc.), and;
d. discussion of rationale and methods for any other types of evaluation planned.

The section should also include a discussion of the overall weight of evidence approach. Discussion of a qualitative weight of evidence approach typically includes a description of the relative reliability, relevance, and importance of each line of evidence and explains the general process by which conclusions will be reached.

6. Section 4.1.2, Pore Water Sampling, page 19

The third sentence mixes units (ft and cm), and the rest of the section uses units of ft and in. Consistency in units is recommended.

7. Section 5.3.1, Precision, page 30 and Section 5.3.2, Accuracy, page 31

Project- or method-specific precision and accuracy criteria for the project have not been presented in these sections.

8. Section 5.3, Data Quality Objectives, page 29

There is no "sensitivity" DQO established within this section of the document.

9. Section 5.3.3, Completeness, page 31

A completeness goal on the sample level of 90% has been established. There are several critical samples (such as surface water dissolved copper) that would suggest that a completeness goal of 100%, for those samples would be appropriate.

10. Section 5.4.2, Sampling Quality Control Requirements and Acceptability Criteria, page 33

Acceptability criteria have not been established in this section.

11. Figure 8.

Only one on-site and one off-site wetland surface water sample locations are proposed. Unless multiple replicates are evaluated for each sample, statistical analyses cannot be performed using bioassay results. A single sample provides poor spatial coverage and statistical power.

4.0 SUMMARY

In summary:

1. Based on the background screen assessment metals may be added.
2. Complete the 7-step DQO process using the latest guidance.
3. Expand discussion of data interpretation.
4. Expand or justify proposed surface water sampling.

The re-evaluation of COPEC based on the background screen may add additional chemicals that will need to be carried into the BERA. In addition, completion of the 7-step DQO process in conjunction with the clear discussion of data interpretation will provide for a more obvious path-forward for the site.

REFERENCES

United States Environmental Protection Agency (EPA). 2006. Guidance on Systematic Planning using the Data Quality Objectives Process. EPA QA/G4. EPA/240/B-06/001. February.